



Superfund At Work

Hazardous Waste Cleanup Efforts Nationwide

Re-Solve Inc. Site Profile

Site Description:

Former chemical reclamation facility

Site Size: 6 acres

Primary Contaminants:

PCBs, VOCs, and heavy metals

Ecological Concerns:

Protected species of wildlife and habit in the Copicut River, Cornell Pond, and adjacent wetlands

Health Risks:

Acute toxicity, skin and eye irritation, respiratory distress; central nervous system disorders, increased risk of cancer

Nearby Population:

300 people within one mile

Year Listed on the NPL: 1983

Region: 1

State: Massachusetts

Congressional District: 10

Success in Brief

Enforcement Tools Allocate Liability, Speed Cleanup

Re-Solve, Inc. was one of the first hazardous waste sites in the nation to be investigated by the U.S. Environmental Protection Agency (EPA) following enactment of the Superfund law in 1980. Throughout 24 years of chemical reclamation and improper waste disposal, pollutants had degraded the ground water, surrounding wetlands, and a state-protected river. EPA identified the major waste contributors and negotiated a "mixed funding agreement with 56 parties to pay cleanup costs totaling more than \$30 million. In addition, 167 de minimis generators agreed to "cash out", settling their liability through volumetric allocation. Elements of the comprehensive remediation included:

- Removal of 15,000 cubic yards of hazardous chemical sludge from four abandoned lagoons;
- Treatment of contaminated soil and wetland sediments using a Low Thermal Desorption technology; and
- A ground water pump and treat system to restore water quality levels for municipal users and threatened wildlife species beyond the waste management area.

The settlements reached with the waste contributors reimbursed \$15.5 million, including interest, to EPA and the Commonwealth of Massachusetts for past cleanup costs. EPA has an ongoing suit against five non-settlers to recover an additional \$3.7 million in cleanup costs.

The Site Today

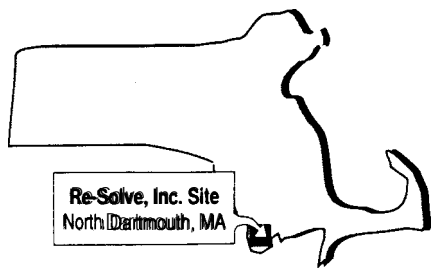
EPA is overseeing efforts to excavate and treat soil and sediments; the wetlands will be back-filled with off-site soil and restored with natural vegetation by July 1994. By September, treated soil on site will be backfilled, graded, and covered with 18 inches of crushed stone.

Design work is under way for the ground water pump and treat system; responsible parties have agreed to construct the treatment plant in 1996 and begin restoration of adjacent river areas.

Photo: Tom Tyring, courtesy of Massachusetts
Natural Heritage and Endangered Species Program



The Marbled Salamander is classified as "Threatened" in the state because of acute sensitivity to pollutants in water and loss of habitat, including wooded areas along the Copicut River. Continued on page 5.



The six-acre Re-Solve, Inc. site is located in North Dartmouth, Massachusetts, eight miles west of the City of Fall River. From 1956 to 1980, Re-Solve, Inc. operated as a chemical reclamation facility that handled solvents, waste oils, organic and inorganic liquids and solids, acids, alkalies, and polychlorinated biphenyls (PCBs). The company separated impurities from these hazardous materials and sold recycled chemicals.

During processing, distillation residue, liquid sludge waste, and impure solvents

A Site Snapshot

were dumped into four unlined lagoons that seeped directly into the ground water. To control dust, workers spread waste oil throughout the site and landfarmed other oil waste in one portion of the site.

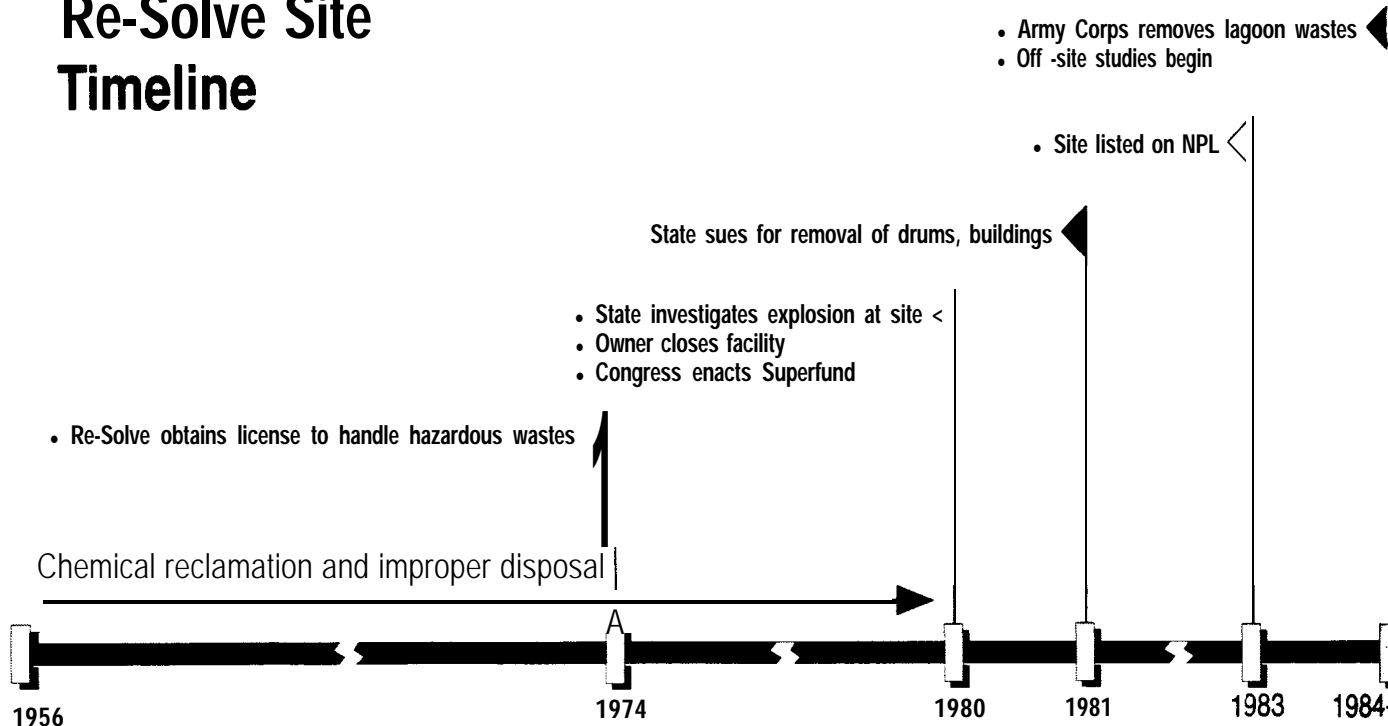
As a result, the site soil was thoroughly saturated with PCBs and volatile organic compounds (VOCs) including trichloroethylene, vinyl chloride, methylene chloride, and toluene, and to a lesser degree, the heavy metal lead.

The site is surrounded by wetlands and forest and includes the Cornell Pond and the Copicut River, all of which have been polluted to various degrees. Located less than 500 feet from the site, the river is a designated state

Wildlife Protection Area and was once a popular fishing spot. Some wetland and river species, such as eels, have bioaccumulated various toxins and are no longer safe to eat.

Many of the waste chemicals at the site can cause acute toxic reactions, skin and eye irritation, respiratory problems, increased risk of cancer, and central nervous system disorders. About 300 people live within a one-mile radius of the site, which sits over an aquifer used for municipal water. No site-related health problems were reported by past employees to local authorities and fences and posted warning signs have reduced exposure to the general public.

Re-Solve Site Timeline



Waste Chemicals Saturate Soil and Ground Water

In 1956, Re-Solve, Inc. opened a solvents recovery facility in North Dartmouth. Area manufacturers sent waste chemicals there for removal of impurities and potential reclamation. In 1974, the Massachusetts Division of Water Pollution Control issued the company a license to collect and dispose of hazardous wastes. But Re-Solve's improper handling and storage practices over the 24-year period resulted in extensive environmental damage.

Facility Closes Rather than Comply

In 1980, a fatal explosion at the site drew the attention of North Dartmouth officials. Residents had begun to complain about offensive odors to the local Board

of Health which asked the Massachusetts Department of Environmental Quality Engineering (DEQE) to investigate. DEQE discovered that the facility failed to comply with state or federal hazardous waste management regulations and ordered the company to take corrective action.

In December 1980, the Massachusetts Division of Hazardous Waste agreed to accept the company's offer to surrender its disposal license on condition that all hazardous waste be removed. Instead, the company closed the facility, leaving behind about 150 drums. The state Attorney General then sued Re-Solve Inc. in 1981 to remove the drums, debris, and buildings. The company grudgingly complied, covered the site

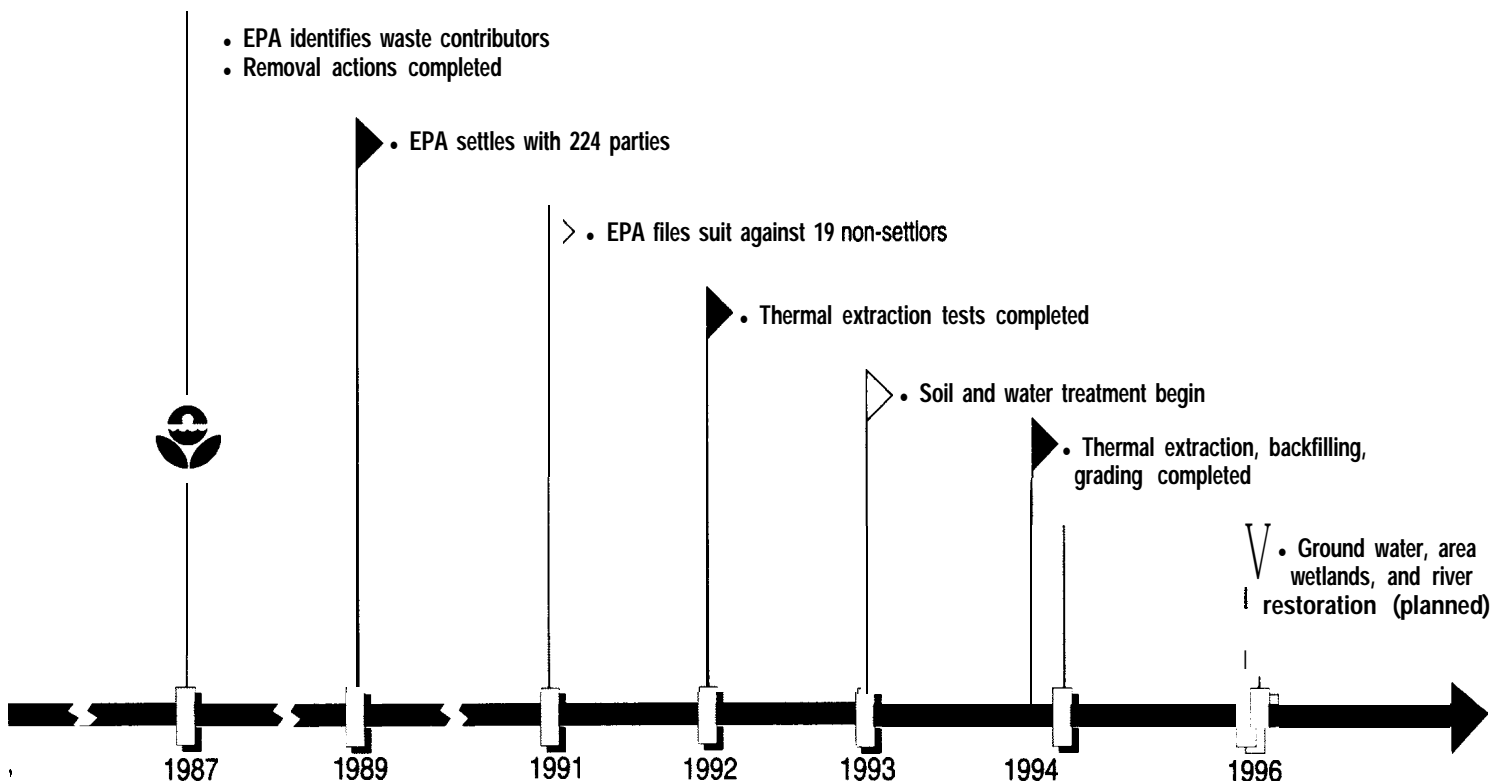
with sand, but abandoned the four lagoons.

New Law Builds State-Federal Partnerships

Re-Solve was one of thousands of abandoned industrial sites that caused Congress to enact the Comprehensive Environmental Response, Compensation, and Liability Act in the fall of 1980. This law established the Superfund program to clean up the myriad of problems associated with improper hazardous waste disposal. The states nominated their worst sites and Re-Solve was added to the EPA's National Priorities List (NPL) in 1983.

Initial Removal Stabilizes Site

Later that year, EPA completed



a study of the site's contamination and enlisted the help of the U.S. Army Corps of Engineers to remove highly contaminated soil and lagoon sediments. In 1984 and 1985, the Corps removed 15,000 cubic yards of waste materials to permitted disposal facilities in New York and Ohio. But significant quantities of low-level contamination still remained on site.

A second study completed in early 1987 confirmed suspicions that pollutants had migrated into surrounding wetlands and the Copicut River. Samples of area wildlife revealed that river eels had bioaccumulated the PCBs, thus many other species were at risk. Based on all the information, EPA held public meetings and received comments from area residents on remedies selected to control the sources of contamination.

Soil Cleanup Technique Tested

In September 1987, EPA signed a Record of Decision to address the remaining lower levels of contaminants in soil and ground water.

The first phase was to excavate and treat soil using Chemical Dechlorination. The second phase would extract and treat ground water to "maximum contaminant levels" under federal drinking water standards.

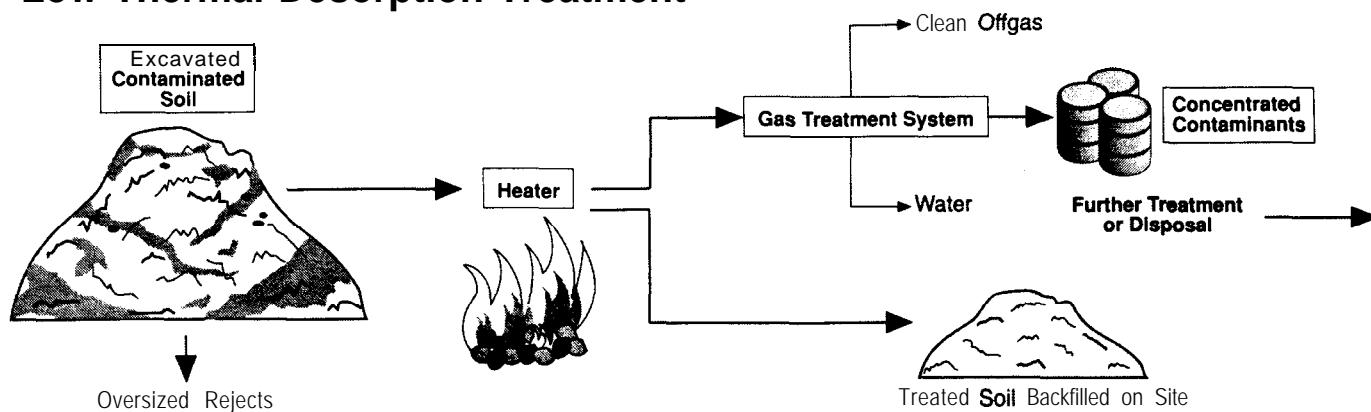
Following the signing of the mixed funding consent decree in 1989, the first phase was divided into two innovative steps. First, soil would be excavated and treated by a Low Thermal Desorption process that heats the soil and vaporizes the PCBs and VOCs. Vapors are collected and condensed into concentrated liquid form. Second, dechlorination would be used to reduce the toxicity of the liquid so it could be safely landfilled. EPA agreed to pay for 30% of the costs up to \$6.9 million.

In May 1992, both technologies were piloted. The Dechlorination process required significant amounts of chemical reagent to be added to the concentrated liquid to reduce its toxicity. In addition, the volume of liquid was increased by six times and its toxicity still required incineration. As a

result, EPA prepared an "Explanation of Significant Differences" in June 1993, removing the Dechlorination step. Only the Desorption process is being used, and concentrated liquid waste and other system residuals are shipped to a commercial incinerator.

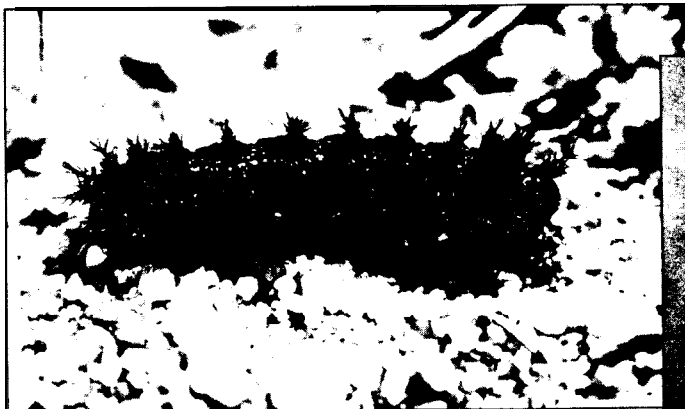
Operation of the soil treatment technology began in June 1993, accompanied by a system to depress the ground water table sufficient to excavate contaminated soil. Extracted ground water is undergoing treatment with an air stripper and activated carbon, and discharged to the Copicut River; treated soil is used as backfill and covered with gravel. About 3,000 cubic yards of PCB-contaminated sediments discovered in the wetlands are undergoing either the same treatment or backfilling, depending on PCB concentration. By July 1994, the thermal extraction process will be complete; backfilling and grading will be completed by September. Cleanup of off-site areas where contaminants have migrated in ground water will follow.

Low Thermal Desorption Treatment



Threatened Wetland and River Species

Photo: Bruce Sorrie

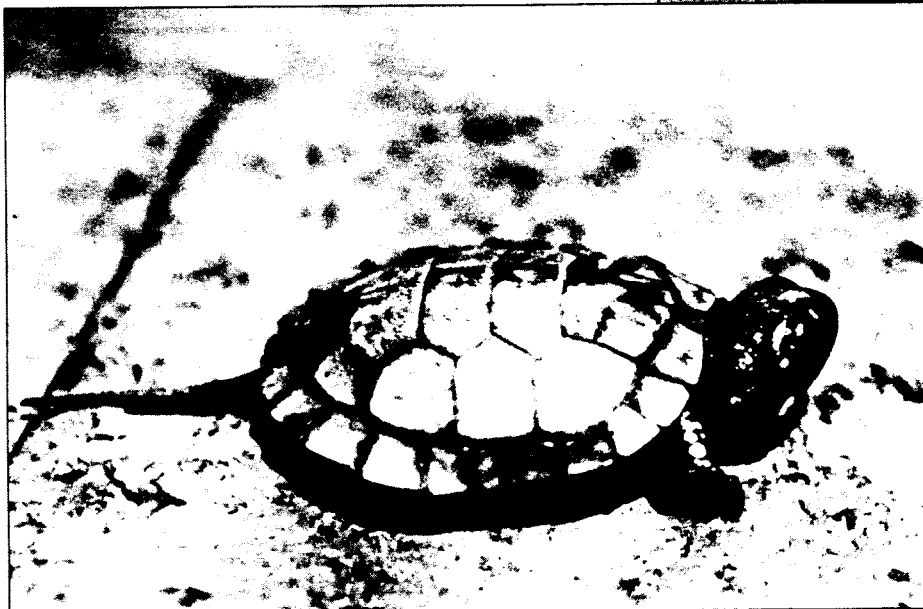


The Barrens Buck Moth is a beautiful member of the Giant Silk Moth family with jet black wings spanning two inches. Caterpillars pass through six larval stages and develop formidable spines tipped with poison. The species inhabits pitch pine and scrub oak barrens in sandy soil, including the wetland areas to the north and east of the Re-Solve Superfund site.



Photo: Chris Leahy

Photo: Mickey Marcus



The Spotted Turtle lives in meadows, bogs, swamps, small ponds, and other wetlands and prefers to eat under water. Shy and evasive, this reptile is classified as a species of "Special Concern" in Massachusetts because the population has been severely reduced by polluted surface water.

All photos courtesy of Massachusetts Natural Heritage and Endangered Species Program.

One of the treasures of a cool, moist forest, The Marbled Salamander, shown on page 1, has bold silver markings on a stocky frame that averages only about four inches in length. A lithe and exquisite life form, woodland salamanders play a crucial role in the food chain, but many species are rapidly disappearing.

Innovative Settlement Tools Allocate Liability

By early 1987, enforcement investigators had identified more than 250 parties potentially responsible for Re-Solve's hazardous wastes. EPA notified the companies of an allocation scheme to apportion liability, based on volume. In May 1989, EPA and Massachusetts officials entered into agreements with 224 generator parties in which EPA recovered \$8.1 million in previous costs and the state regained \$500,000.

Of the 224 settling parties, 56 agreed to perform the site cleanup work. A group of 167 deposited \$7.8 million into a Trust Fund for the effort and settled with EPA as minor (*de minimis*) parties who had contributed very small amounts of waste. To expedite the work, EPA agreed to fund up to

\$6.9 million under a "mixed-funding" agreement.

Mixed funding is a settlement strategy in which EPA settles with fewer than all of the responsible parties for a substantial portion of the cleanup. EPA contributes the remainder of the resources and recovers costs from financially viable parties who did not sign the mixed funding agreement.

In September 1989, EPA signed two other administrative settlements in which one group paid \$3.8 million in past costs and one company paid approximately \$1.7 million. In March 1990, EPA then filed suit against 19 others who had not participated in previous settlements; 14 parties had paid \$1.9 million in a series of settlements as of February 1994.

Success at Re-Solve, Inc.

EPA's early remedial actions stabilized the site through removal of the most contaminated materials. State officials and the EPA Remedial Project Manager then negotiated a series of innovative agreements including "mixed funding" and "cash out" for small quantity generators.

Signing on to a variety of administrative settlements, waste contributors agreed to pay for and conduct a comprehensive remediation of soil, sediments, area ground water, and surrounding wildlife areas. Treatment of area ground water will commence in 1996.

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